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Page 1 of 44

# Test Report

Verified code: 424125

Report No.: E20241111636501-19EN

Customer: Lumi United Technology Co., Ltd

Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

Sample Name: Climate Sensor W100

Sample Model: TH-S04E

Receive Sample Date: Nov.12,2024

Test Date: Nov.15,2024 ~ Nov.21,2024

Reference Document: AS/NZS 4268:2017

Test Result: Pass

Prepared by: Huang Lifang  
Huang Lifang

Reviewed by: Jiang Tao  
Jiang Tao

Approved by: Xiao Liang  
Xiao Liang

GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2024-12-17

GRG METROLOGY & TEST GROUP CO., LTD.

Address: No.163, Pingyun Road, West of Huangpu Avenue, Guangzhou, Guangdong, China  
Tel: (+86) 400-602-0999 FAX: (+86) 020-38698685 Web: <http://www.grgtest.com>



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**REPORT ISSUED HISTORY**

Report Version	Report No.	Description	Compile Date
1.0	E20241111636501-19EN	Original Issue	2024-12-10

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**1. TEST RESULT SUMMARY**

Test Item	Test mode	Test Requirement	Test Method	Test Result
<b>Transmitter Part</b>				
Maximum EIRP	Mode 1	AS/NZS 4268:2017 Clause 6.3	ETSI EN 300 328 V2.2.2/5.4.2.2.1	PASS
Power Spectral Density	Mode 1	AS/NZS 4268:2017 table 1 row 59	ANSI IEEE C63.10-2020 section 11.10	PASS
Occupied Channel Bandwidth & Operating frequency	Mode 1	AS/NZS 4268:2017 Clause 6.5 and Clause 6.6	ETSI EN 300 328 V2.2.2/5.4.7.2.1	PASS
Transmitter spurious emissions	Mode 1	AS/NZS 4268:2017 Clause 6.4	ETSI EN 300 328 V2.2.2/5.4.9.2.2	PASS
<b>Receiver Part</b>				
Receiver spurious emissions	Mode 2	AS/NZS 4268:2017 Clause 7.2	ETSI EN 300 328 V2.2.2/5.4.10.2.2	PASS

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## 2. GENERAL DESCRIPTION OF EUT

### 2.1 APPLICANT INFORMATION

Name: Lumi United Technology Co., Ltd  
Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

### 2.2 MANUFACTURER

Name: Lumi United Technology Co., Ltd  
Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

### 2.3 BASIC DESCRIPTION OF EUT

Product Name: Climate Sensor W100  
Product Model: TH-S04E  
Adding Model: TH-S04D  
Models Difference: The model No.TH-S04E & TH-S04D have the same technical construction including circuitdiagram,PCB LAYOUT, hardware version and software version identical, except sales area and packaging are different.  
Trade Name: Aqara  
Power supply: DC 3V  
Battery Specification: Button batteries;  
Model: CR2450;  
Nominal Voltage: 3V.  
Frequency Band: 2402MHz - 2480MHz  
Modulation Type: Bluetooth LE with 1M&2M: GFSK  
Antenna Type: PCB Antenna  
Antenna Gain: 1dBi gain (Max.)  
Sample submitting way:  Provided by customer  Sampling  
Sample No: E20241111636501-0001,E20241111636501-0002

Hardware Version: V12

Software Version: V0.0.2.0

Note:

1. The EUT antenna gain is provided by the applicant. This report is made solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions.

2. Based on the differences in models, the model TH-S04E was tested and recorded in this report.

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## 2.4 TEST MODE

- Test mode 1: BLE TX mode  
Test mode 2: BLE RX mode  
Test mode 3: BLE normal mode

## 2.5 FREQUENCY BAND AND THE TEST FREQUENCY

Channel	Frequency (MHz)	Channel	Frequency (MHz)
*00	<b>2402</b>	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
*19	<b>2440</b>	*39	<b>2480</b>

\* is the test frequency

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## 2.6 DESCRIPTION OF ADAPTIVE EQUIPMENT

The type of the equipment	<input type="checkbox"/> FHSS	<input checked="" type="checkbox"/> Non-FHSS		
Adaptive / non-adaptive equipment	<input type="checkbox"/> Non-adaptive Equipment	<input checked="" type="checkbox"/> adaptive Equipment without the possibility to switch to a non-adaptive mode	<input type="checkbox"/> adaptive Equipment which can also operate in a non-adaptive mode	
The equipment has an implemented	<input type="checkbox"/> Frame Based equipment	<input checked="" type="checkbox"/> Load Based equipment	<input type="checkbox"/> non-LBT based DAA mechanism	<input type="checkbox"/> other
Device Class	<input type="checkbox"/> WIFI	<input checked="" type="checkbox"/> Bluetooth Low Energy (5.2)	<input type="checkbox"/> Bluetooth EDR/BR (5.0)	
Antenna Gain	<input checked="" type="checkbox"/> Antenna1 1dBi	<input type="checkbox"/> Antenna 2 dBi	<input type="checkbox"/> Antenna 3 dBi	<input type="checkbox"/> Antenna 4 dBi
Beamforming Gain	<input type="checkbox"/> Yes, dBi	<input checked="" type="checkbox"/> No		
Extreme operating conditions	<input checked="" type="checkbox"/> Operating temperature range:	<input checked="" type="checkbox"/> Min -20°C	<input checked="" type="checkbox"/> Max +60°C	

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### 3. LABORATORY AND ACCREDITATIONS

#### 3.1 LABORATORY

The tests and measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

Add : No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen,  
518110, People's Republic of China  
P.C. : 518110  
Tel : 0755-61180008  
Fax : 0755-61180008

#### 3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

China CNAS(L0446)

Copies of granted accreditation certificates are available for downloading from our web site,  
<http://www.grgtest.com>

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#### 4. MEASUREMENTS UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in ETSI EN TR 100 028-1 (i.15) and ETSI EN 100 028-2(i 8):

Measurement	Frequency	Uncertainty	
Radiated Emission	Horizontal	30MHz~200MHz	4.0 dB <sup>1)</sup>
		200MHz~1000MHz	4.1 dB <sup>1)</sup>
		1GHz~12.75GHz	4.9 dB <sup>1)</sup>
	Vertical	30MHz~200MHz	3.9 dB <sup>1)</sup>
		200MHz~1000MHz	4.2 dB <sup>1)</sup>
		1GHz~12.75GHz	5.0 dB <sup>1)</sup>

Measurement	Uncertainty
RF frequency	$6.0 \times 10^{-6}$
RF power conducted	0.78 dB
Occupied channel bandwidth	0.40 dB
Unwanted emission, conducted	0.68 dB
Humidity	6.0 %
Temperature	2.0°C

Note:

<sup>1)</sup> This uncertainty represents an expanded uncertainty expressed at approximately the 95%.  
This uncertainty represents an expanded uncertainty factor of  $k=2$ .

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## 5. EQUIPMENT AND TOOLS USED DURING TEST

### 5.1 TEST EQUIPMENT AND TOOLS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
<b>Maximum EIRP &amp; Maximum e.i.r.p. spectral density &amp; occupied channel bandwidth &amp; Operating frequency</b>				
Automatic power measuring unit	TONSCEND	JS0806-2	21B8060365	2024-12-28
Programmable constant temperature and humidity test chamber	FC	FPHC-23AW-40	FD202306015	2025-08-26
Spectrum Analyzer	R&S	FSW43	102072	2025-06-14
BT/WIFI System	Tonscend		JS1120-3	
<b>Transmitter unwanted emissions in the spurious domain &amp; Receiver spurious emissions</b>				
Bi-log Antenna	Schwarzbeck	VULB9163	01279	2025-02-04
Horn Antenna	Schwarzbeck	BBHA9120D	02499	2025-08-30
Amplifier	Tonscend	TAP037030	AP20E8060081	2025-03-01
Amplifier	Tonscend	TAP01018048	AP20E8060076	2025-03-01
Amplifier	Tonscend	TAP9E6343	AP20E806065	2025-03-01
Spectrum Analyzer	KEYSIGHT	N9010A	MY55370330	2025-08-23
Spectrum Analyzer	R&S	FSV3044	101184	2025-07-19
Test SW	Tonscend		JS36-RSE/5.0.0.1	

Note: The calibration interval of the above test instruments is 12 months.

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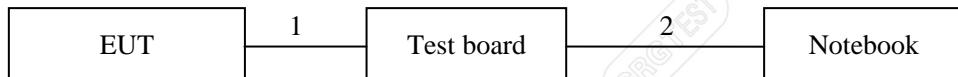
## 5.2 LOCAL SUPPORTIVE INSTRUMENTS

Name of equipment	Manufacturer	Model	Serial number	Note
Notebook	DELL	Latitude3300	2C6CFW2	/
Test board	/	/	/	/

No.	Cable Type	Qty.	Shielded Type	Ferrite Core(Qty.)	Length
1	Serial cable	1	No	0	0.2m
2	USB cable	1	No	0	0.5m

Note: <sup>(1)</sup> The notebook is just used to produce fixed frequency transmitting.

## 5.3 CONFIGURATION OF SYSTEM UNDER TEST



## 5.4 TEST SOFTWARE

Software version	Test level
QCOM_V1.0	60

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## 6. RADIO TECHNICAL REQUIREMENT SPECIFICATION

### 6.1 MAXIMUM EIRP

Test Requirement: AS/NZS 4268:2017 Clause 6.3

Test Method: ETSI EN 300 328 V2.2.2/5.4.2.2.1

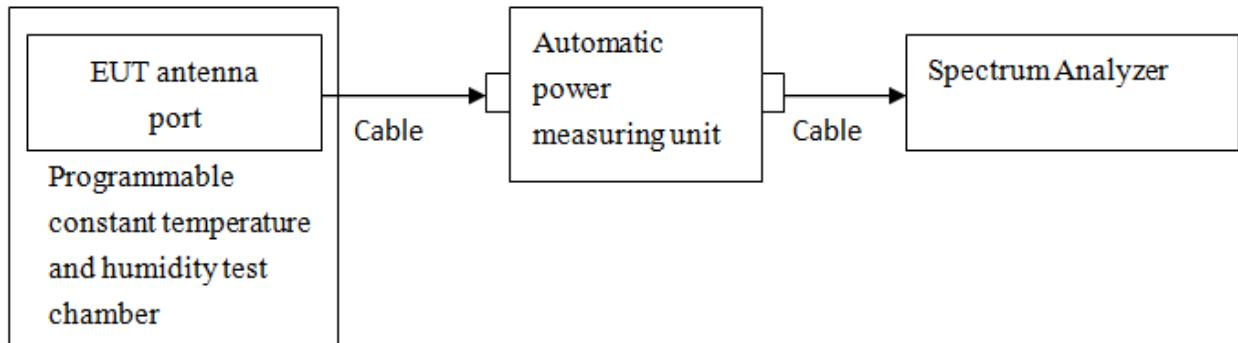
#### 6.1.1 LIMIT

For adaptive equipment, the maximum RF output power shall be 20 dBm.

The maximum RF output power for non-adaptive equipment shall be declared by the manufacturer and shall not exceed 20 dBm. See clause 5.4.1 m). For non-adaptive equipment, the maximum RF output power shall be equal to or less than the value declared by the manufacturer.

This limit shall apply for any combination of power level and intended antenna assembly.

#### 6.1.2 TEST CONFIGURATION



#### 6.1.3 TEST PROCEDURES

Test procedure: Test procedure is according to Clause 5.3.2.2.1 of ETSI EN 300 328 V2.2.2

Test channel: Lowest channel, Middle channel, Highest channel for BLE

Test condition: Normal and extreme test conditions.

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### 6.1.4 TEST RESULTS

Test environment: Normal condition: 23.2°C/51%RH/101.0kPa

Extreme test conditions: Low Temp: -20°C  
High Temp: +60°C

Test Engineer: Qin Tingting

Test Date: 2024-11-21

Test Voltage: DC 3V

Test Condition	Test mode	Antenna	Frequency [MHz]	EIRP[dBm]	Limit[dBm]	Verdict
NTNV	BLE_1M	Ant1	2402	8.49	20	PASS
			2440	8.48	20	PASS
			2480	8.43	20	PASS
	BLE_2M	Ant1	2402	8.49	20	PASS
			2440	8.47	20	PASS
			2480	8.42	20	PASS
LTNV	BLE_1M	Ant1	2402	8.49	20	PASS
			2440	8.49	20	PASS
			2480	8.43	20	PASS
	BLE_2M	Ant1	2402	8.49	20	PASS
			2440	8.48	20	PASS
			2480	8.43	20	PASS
HTNV	BLE_1M	Ant1	2402	8.49	20	PASS
			2440	8.48	20	PASS
			2480	8.43	20	PASS
	BLE_2M	Ant1	2402	8.48	20	PASS
			2440	8.48	20	PASS
			2480	8.42	20	PASS

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## 6.2 POWER SPECTRAL DENSITY

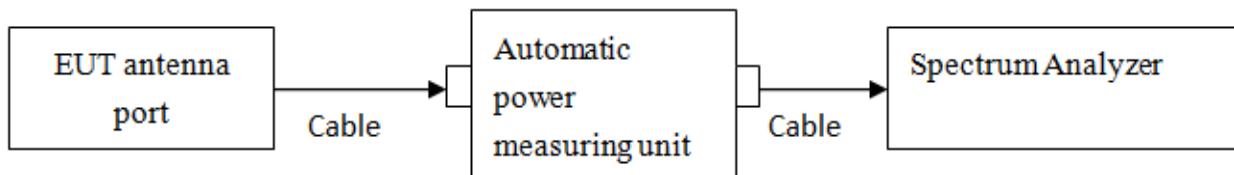
Test Requirement: AS/NZS 4268:2017 table 1 row 59

Test Method: ANSI IEEE C63.10-2020 section 11.10

### 6.2.1 LIMIT

The limit is 25mW per 3kHz.

### **6.2.2 TEST CONFIGURATION**



### **6.2.3 TEST PROCEDURES**

Test condition: Normal test conditions

Test channel: Lowest channel, Middle channel, Highest channel for BLE

- 1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
  - 2) Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
  - 3) Set the analyzer span to 1.5 times the DTS bandwidth. Set the RBW = 3 kHz. Set the VBW  $\geq$  3 RBW. Detector = peak. Ensure that the number of measurement points in the sweep  $\geq$  2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
  - 4) Repeat above procedures until all frequencies measured were complete.

Test procedure:

Remark: /

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#### 6.2.4 TEST RESULTS

Test environment: Normal condition:  
23.2°C/51%RH/101.0kPa

Test Engineer: Qin Tingting  
Test Date: 2024-11-21  
Test Voltage: DC 3V

BLE\_1M

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Test Result
Lowest	2402	-9.71	8.00	PASS
Middle	2440	-9.60		PASS
Highest	2480	-9.88		PASS

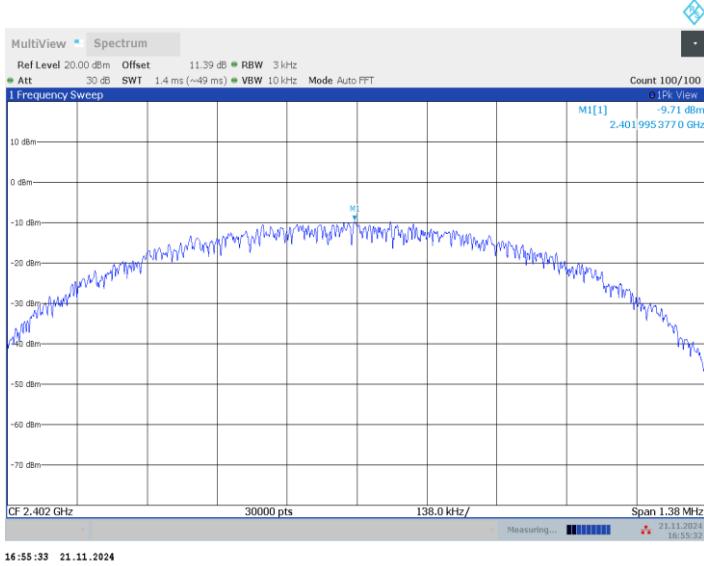
BLE\_1M

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Test Result
Lowest	2402	-10.47	8.00	PASS
Middle	2440	-10.40		PASS
Highest	2480	-10.71		PASS

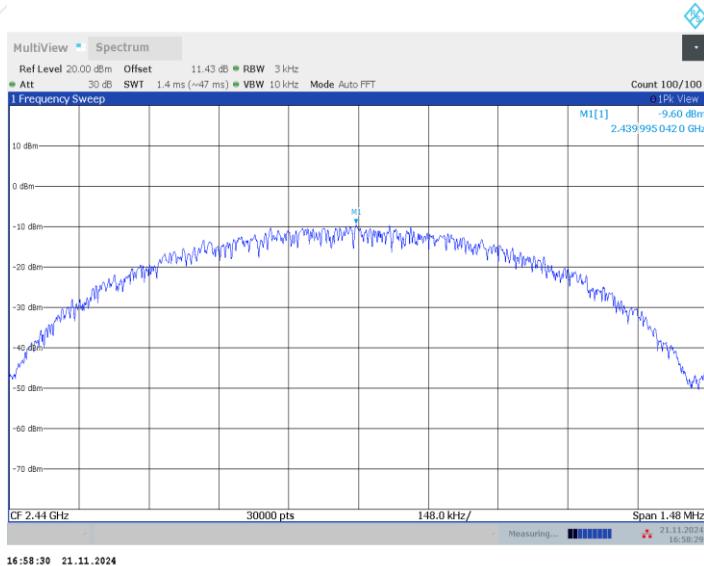
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BLE\_1M

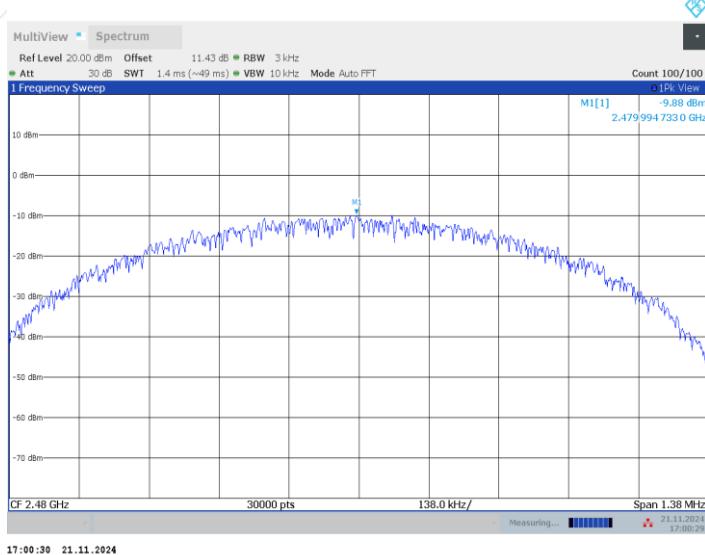
Lowest Frequency (2402MHz)



Middle Frequency (2440 MHz)

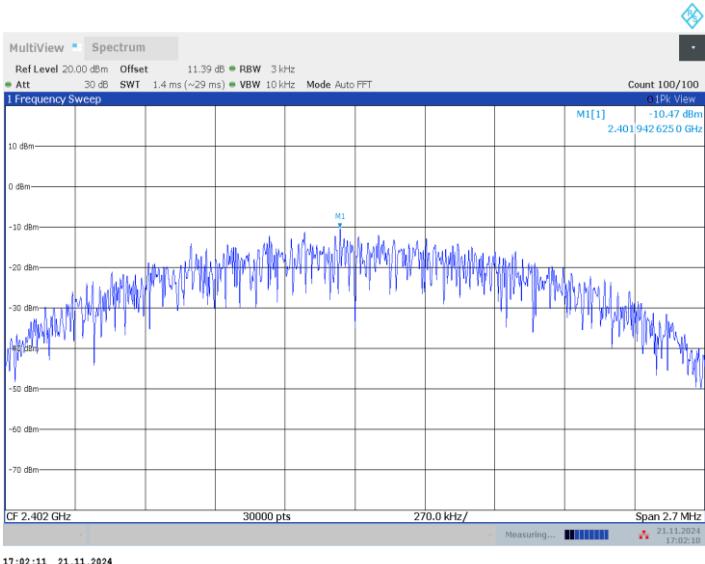


### Highest Frequency (2480MHz)

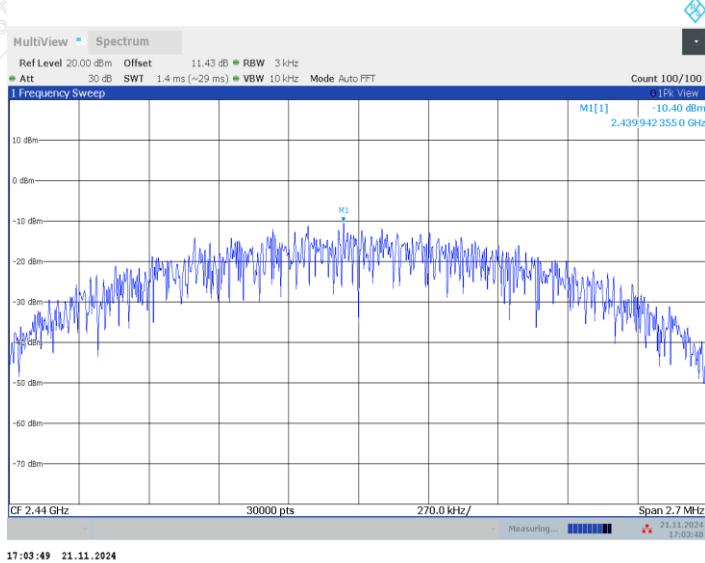


BLE\_2M

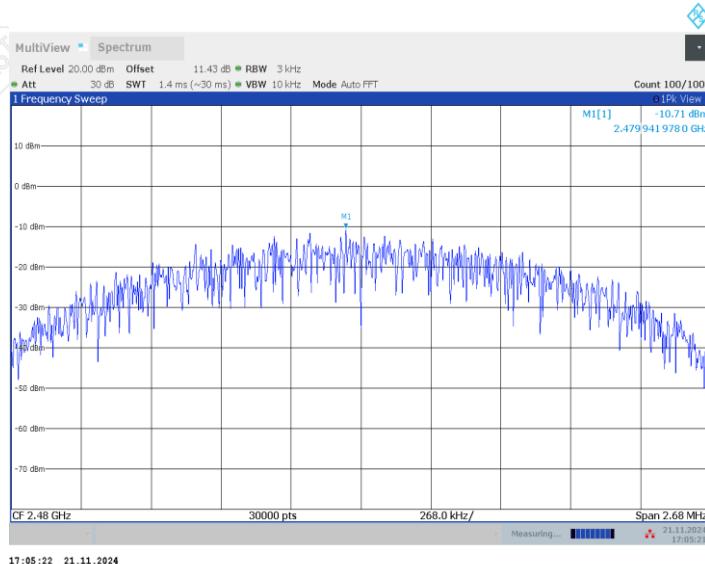
### Lowest Frequency (2402MHz)



## Middle Frequency (2440 MHz)



## Highest Frequency (2480MHz)



### 6.3 OCCUPIED CHANNEL BANDWIDTH & OPERATING FREQUENCY

Test Requirement: AS/NZS 4268:2017 Clause 6.5 and Clause 6.6

Test Method: ETSI EN 300 328 V2.2.2/5.4.7.2.1

#### 6.3.1 LIMIT

This requirement applies to all types of non-FHSS equipment.

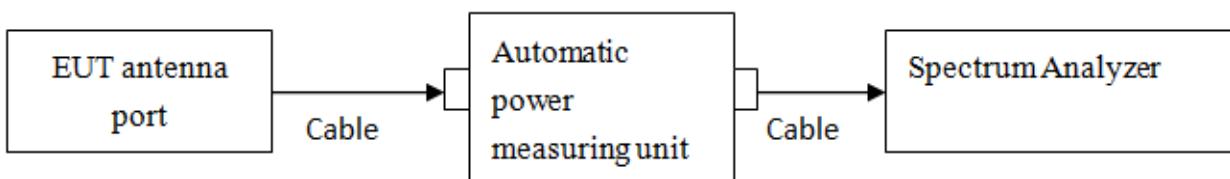
The Occupied Channel Bandwidth shall fall completely within the band given in table 2.

In addition, for non-adaptive equipment using wide band modulations other than FHSS and with e.i.r.p. greater than 10 dBm, the occupied channel bandwidth shall be less than 20 MHz.

Table 2: Service frequency bands

	Service frequency bands
Transmit	2 400 MHz to 2 483,5 MHz
Receive	2 400 MHz to 2 483,5 MHz

#### 6.3.2 TEST CONFIGURATION



#### 6.3.3 TEST PROCEDURES

Test condition: Normal test conditions.

Test channel: Lowest channel, Middle channel, Highest channel for BLE

Test procedure: Test procedure is according to Clause 5.4.7.2.1 of ETSI EN 300 328 V2.2.2

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### 6.3.4 TEST RESULTS

Test environment: Normal condition:

24.3°C/47%RH/101.0kPa

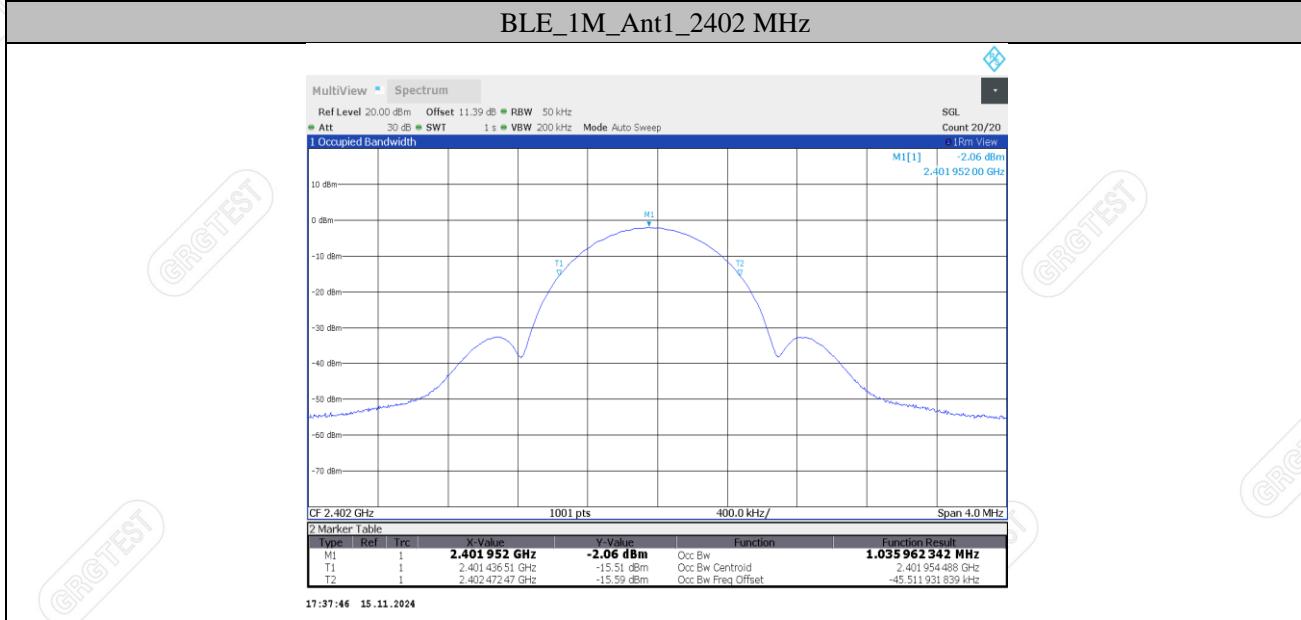
Test Engineer: Qin Tingting

Test Date: 2024-11-15

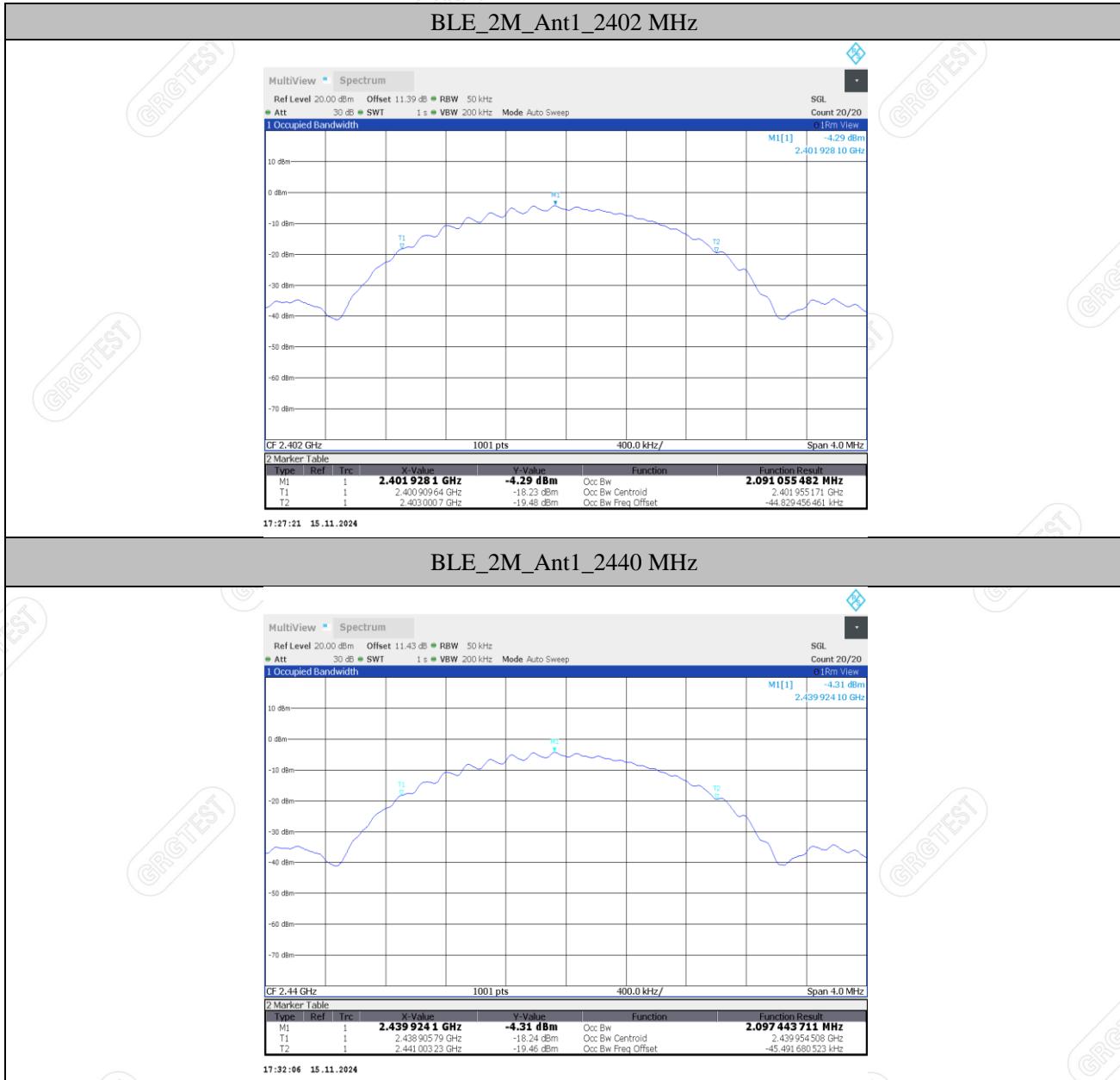
Test Voltage: DC 3V

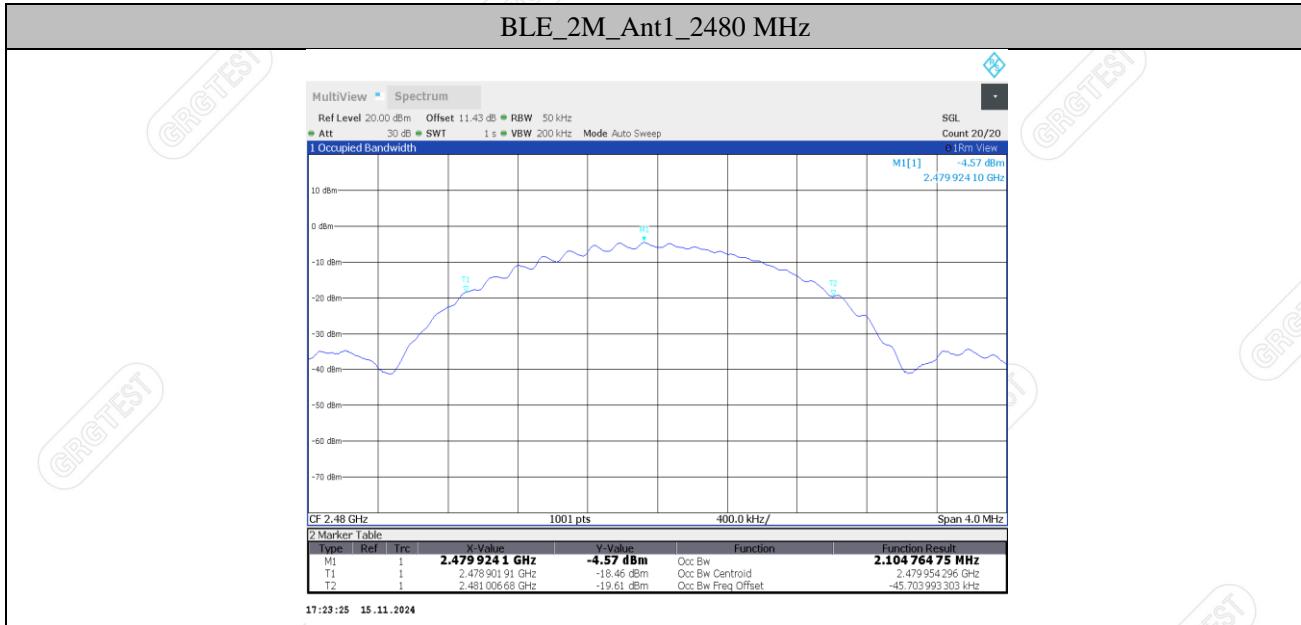
Test Mode	Antenna	Freq[MHz]	OCB[MHz]	F <sub>L</sub> [MHz]	F <sub>H</sub> [MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.036	2401.4365	2402.4725	2400 to 2483.5	PASS
		2440	1.036	2439.4356	2440.4718	2400 to 2483.5	PASS
		2480	1.037	2479.4344	2480.4711	2400 to 2483.5	PASS
BLE_2M	Ant1	2402	2.091	2400.9096	2403.0007	2400 to 2483.5	PASS
		2440	2.097	2438.9058	2441.0032	2400 to 2483.5	PASS
		2480	2.105	2478.9019	2481.0067	2400 to 2483.5	PASS

#### Test screenshots









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## 6.4 TRANSMITTER UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

Test Requirement: AS/NZS 4268:2017 Clause 6.4

Test Method: ETSI EN 300 328 V2.2.2/5.4.9.2.2

### 6.4.1 LIMIT

This requirement applies to all types of non-FHSS equipment.

The transmitter unwanted emissions in the spurious domain shall not exceed the values given in table 2. In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and as e.i.r.p. for emissions above 1 GHz.

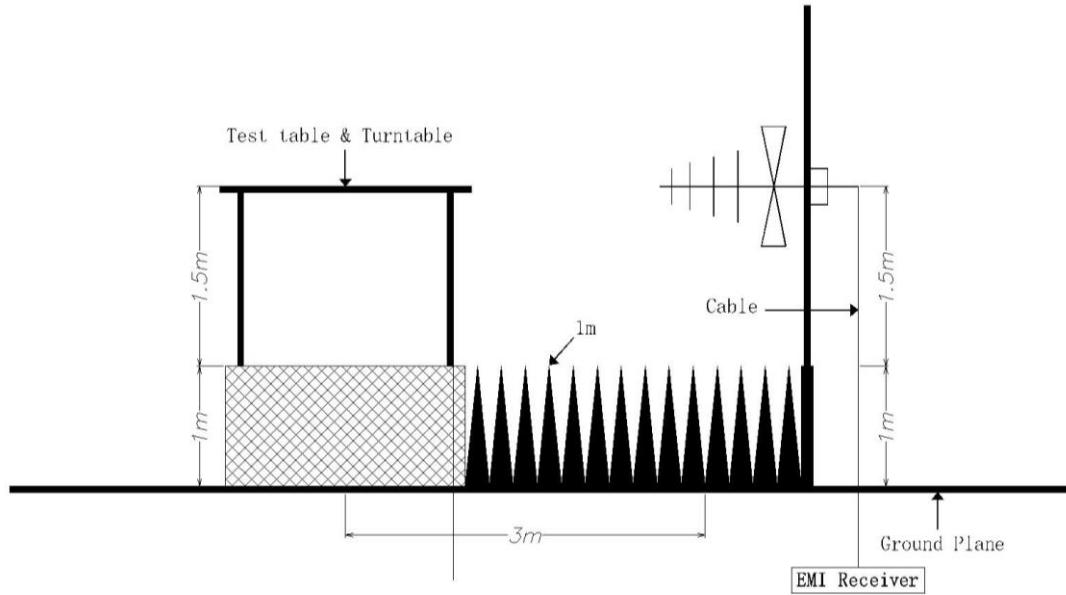
Table 2: Transmitter limits for spurious emissions

Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 694 MHz	-54 dBm	100 kHz
694 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

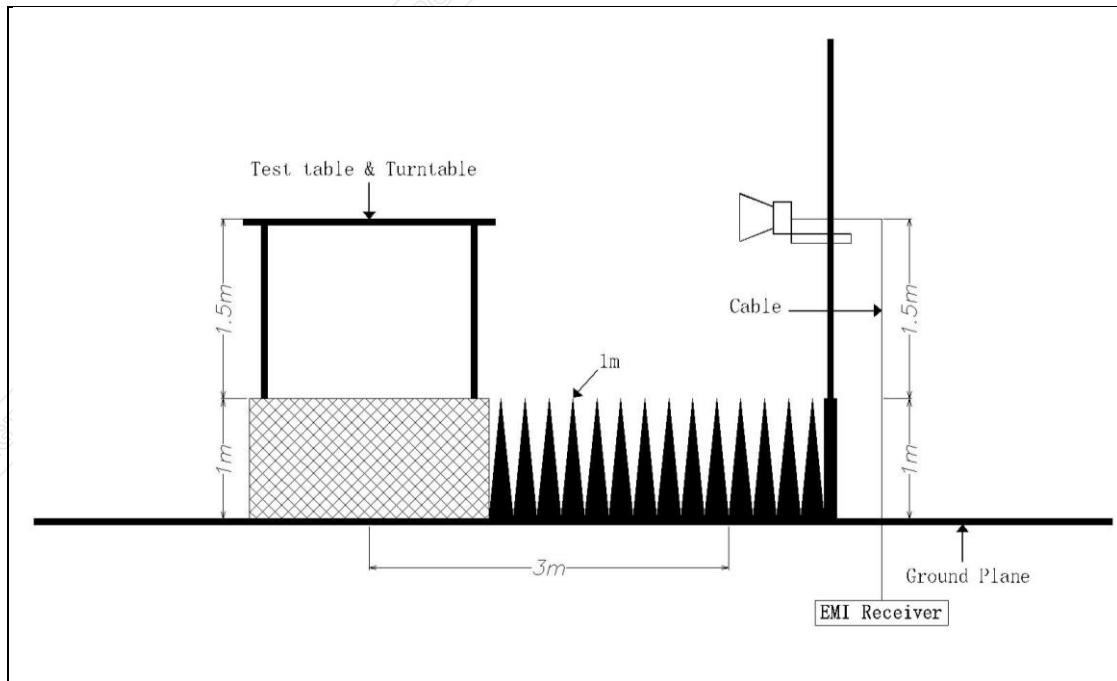
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#### 6.4.2 TEST CONFIGURATION

##### 30MHz~1000MHz



##### 1000MHz~12750MHz



#### 6.4.3 TEST PROCEDURES

Test condition: Mode 1  
Test channel: Lowest channel: (2402MHz), Highest channel: (2480MHz)  
Test procedure: Test procedure is according to Clause 5.4.9.2.1 of ETSI EN 300 328 V2.2.2  
Remark: Pre-test all data rate and channel, tested and recorded the worst case data.

#### 6.4.4 DATA SAMPLE

Frequency [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
XXX	-49.71	-57.90	-30.00	27.90	-8.19	RMS	Horizontal

Frequency (MHz) = Emission frequency in MHz

Reading (dBm) = Uncorrected Analyzer / Receiver reading

Level (dBm) = Reading (dBm) + Factor (dB)

Limit (dBm) = Limit stated in standard

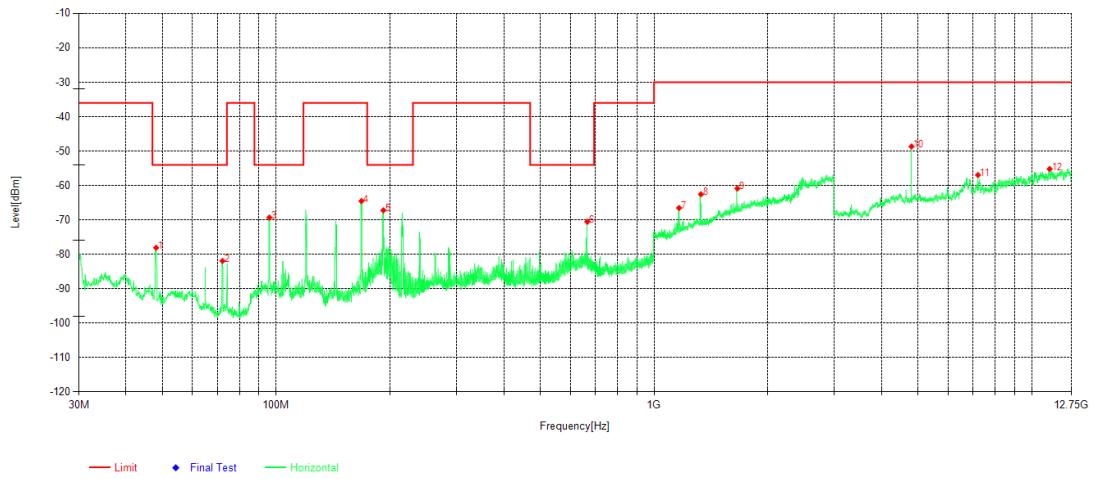
Margin (dB) = Limit(dBm) - Level (dBm)

RMS = Root Mean Square

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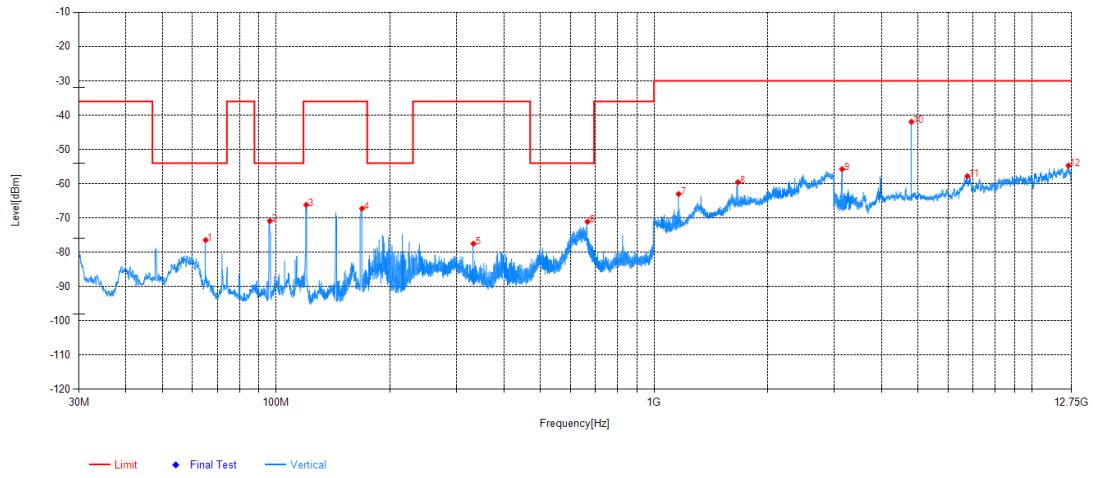
### 6.4.5 TEST RESULTS

Project No	E20241111636501	EUT:	Climate Sensor W100
Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	TX BLE 1M_2402MHz	Voltage:	DC 3V
Environment:	24.3°C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	48.042	-61.79	-78.09	-54.00	24.09	-16.30	RMS	Horizontal
2	72.001	-60.36	-81.93	-54.00	27.93	-21.57	RMS	Horizontal
3	95.863	-52.43	-69.32	-54.00	15.32	-16.89	RMS	Horizontal
4	168.031	-45.02	-64.53	-36.00	28.53	-19.51	RMS	Horizontal
5	191.99	-50.45	-67.22	-54.00	13.22	-16.77	RMS	Horizontal
6	665.641	-63.06	-70.54	-54.00	16.54	-7.48	RMS	Horizontal
7	1164.6	-65.34	-66.55	-30.00	36.55	-1.21	RMS	Horizontal
8	1330.8	-63.31	-62.56	-30.00	32.56	0.75	RMS	Horizontal
9	1661.8	-65.28	-60.88	-30.00	30.88	4.40	RMS	Horizontal
10	4803.75	-46.70	-48.69	-30.00	18.69	-1.99	RMS	Horizontal
11	7206.15	-61.96	-56.98	-30.00	26.98	4.98	RMS	Horizontal
12	11151.97	-68.09	-55.22	-30.00	25.22	12.87	RMS	Horizontal

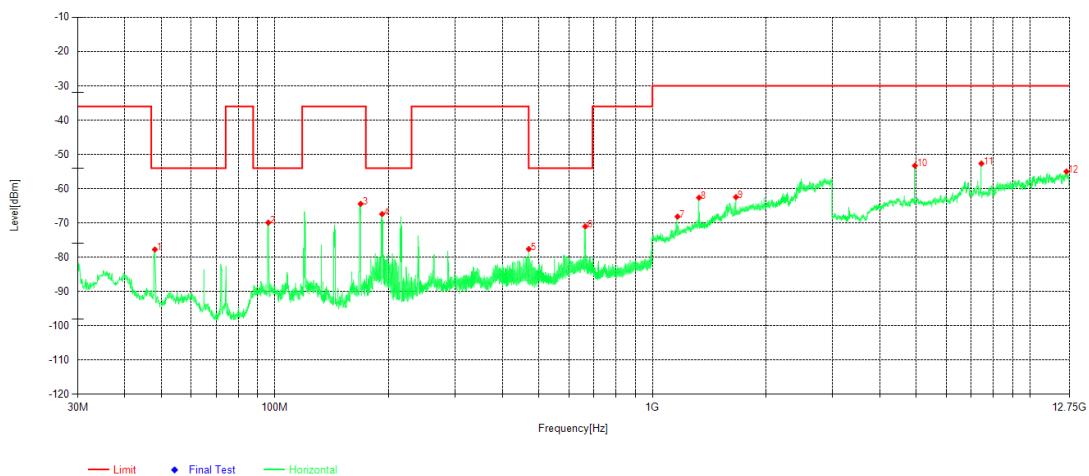
Project No	E20241111636501	EUT:	Climate Sensor W100
Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	TX BLE 1M_2402MHz	Voltage:	DC 3V
Environment:	24.3 °C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/



#### Suspected Data List

NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	65.017	-61.21	-76.45	-54.00	22.45	-15.24	RMS	Vertical
2	96.154	-51.55	-70.86	-54.00	16.86	-19.31	RMS	Vertical
3	120.016	-46.15	-66.17	-36.00	30.17	-20.02	RMS	Vertical
4	168.613	-49.36	-67.26	-36.00	31.26	-17.90	RMS	Vertical
5	332.543	-63.68	-77.50	-36.00	41.50	-13.82	RMS	Vertical
6	666.611	-63.61	-71.10	-54.00	17.10	-7.49	RMS	Vertical
7	1161.6	-62.24	-63.00	-30.00	33.00	-0.76	RMS	Vertical
8	1666.6	-64.35	-59.57	-30.00	29.57	4.78	RMS	Vertical
9	3147.225	-49.20	-55.77	-30.00	25.77	-6.57	RMS	Vertical
10	4803.75	-40.19	-41.97	-30.00	11.97	-1.78	RMS	Vertical
11	6750.825	-64.05	-57.80	-30.00	27.80	6.25	RMS	Vertical
12	12509.17	-69.41	-54.71	-30.00	24.71	14.70	RMS	Vertical

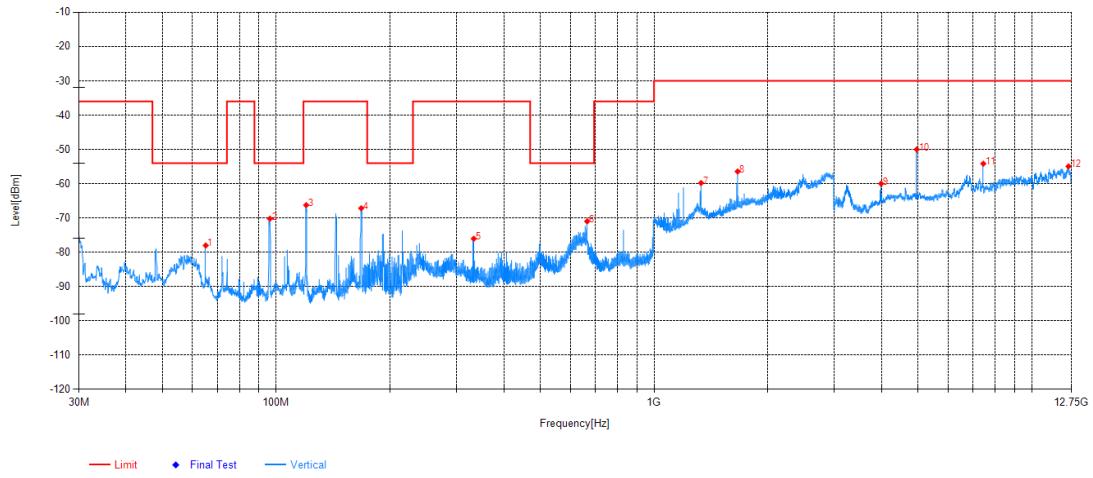
Project No	E20241111636501	EUT:	Climate Sensor W100
Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	TX BLE 1M_2480MHz	Voltage:	DC 3V
Environment:	24.3 °C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/



#### Suspected Data List

NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	48.042	-61.44	-77.74	-54.00	23.74	-16.30	RMS	Horizontal
2	95.96	-53.01	-69.90	-54.00	15.90	-16.89	RMS	Horizontal
3	168.613	-44.94	-64.43	-36.00	28.43	-19.49	RMS	Horizontal
4	192.184	-50.65	-67.41	-54.00	13.41	-16.76	RMS	Horizontal
5	470.283	-66.11	-77.60	-54.00	23.60	-11.49	RMS	Horizontal
6	663.701	-63.64	-71.02	-54.00	17.02	-7.38	RMS	Horizontal
7	1165.4	-66.96	-68.15	-30.00	38.15	-1.19	RMS	Horizontal
8	1328.6	-63.37	-62.63	-30.00	32.63	0.74	RMS	Horizontal
9	1664.2	-66.91	-62.45	-30.00	32.45	4.46	RMS	Horizontal
10	4959.75	-52.25	-53.28	-30.00	23.28	-1.03	RMS	Horizontal
11	7440.15	-57.50	-52.66	-30.00	22.66	4.84	RMS	Horizontal
12	12501.37	-69.66	-55.01	-30.00	25.01	14.65	RMS	Horizontal

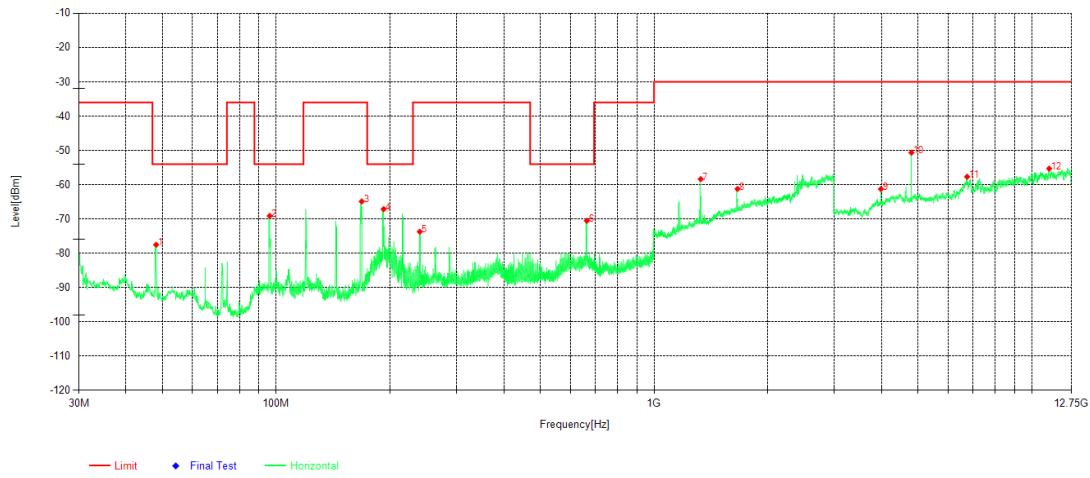
Project No	E20241111636501	EUT:	Climate Sensor W100
Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	TX BLE 1M_2480MHz	Voltage:	DC 3V
Environment:	24.3 °C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/



#### Suspected Data List

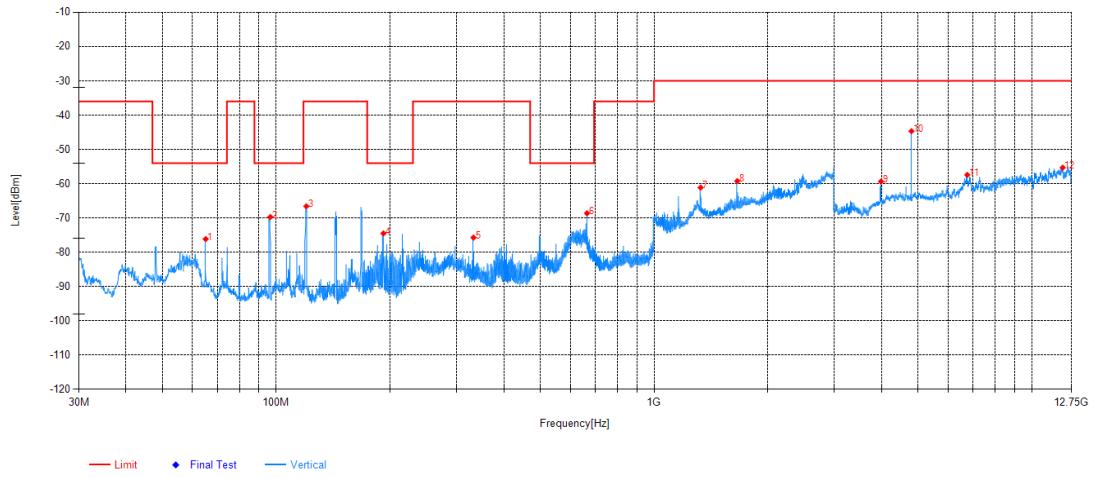
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	65.017	-62.77	-78.01	-54.00	24.01	-15.24	RMS	Vertical
2	96.154	-50.91	-70.22	-54.00	16.22	-19.31	RMS	Vertical
3	119.919	-46.24	-66.26	-36.00	30.26	-20.02	RMS	Vertical
4	167.74	-49.29	-67.16	-36.00	31.16	-17.87	RMS	Vertical
5	333.125	-62.28	-76.06	-36.00	40.06	-13.78	RMS	Vertical
6	665.253	-63.60	-70.99	-54.00	16.99	-7.39	RMS	Vertical
7	1331.6	-61.13	-59.80	-30.00	29.80	1.33	RMS	Vertical
8	1665	-61.20	-56.46	-30.00	26.46	4.74	RMS	Vertical
9	3991.575	-56.49	-59.99	-30.00	29.99	-3.50	RMS	Vertical
10	4959.75	-49.12	-50.02	-30.00	20.02	-0.90	RMS	Vertical
11	7440.15	-59.09	-54.17	-30.00	24.17	4.92	RMS	Vertical
12	12514.05	-69.55	-54.96	-30.00	24.96	14.59	RMS	Vertical

Project No	E20241111636501	EUT:	Climate Sensor W100
Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	TX BLE 2M_2402MHz	Voltage:	DC 3V
Environment:	24.3°C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	48.042	-61.23	-77.53	-54.00	23.53	-16.30	RMS	Horizontal
2	96.057	-52.22	-69.11	-54.00	15.11	-16.89	RMS	Horizontal
3	168.322	-45.38	-64.88	-36.00	28.88	-19.50	RMS	Horizontal
4	192.281	-50.37	-67.12	-54.00	13.12	-16.75	RMS	Horizontal
5	239.714	-57.41	-73.72	-36.00	37.72	-16.31	RMS	Horizontal
6	663.701	-63.14	-70.52	-54.00	16.52	-7.38	RMS	Horizontal
7	1329	-59.13	-58.38	-30.00	28.38	0.75	RMS	Horizontal
8	1663	-65.67	-61.24	-30.00	31.24	4.43	RMS	Horizontal
9	3987.675	-57.38	-61.28	-30.00	31.28	-3.90	RMS	Horizontal
10	4802.775	-48.66	-50.67	-30.00	20.67	-2.01	RMS	Horizontal
11	6744.975	-63.58	-57.69	-30.00	27.69	5.89	RMS	Horizontal
12	11124.67	-67.85	-55.31	-30.00	25.31	12.54	RMS	Horizontal

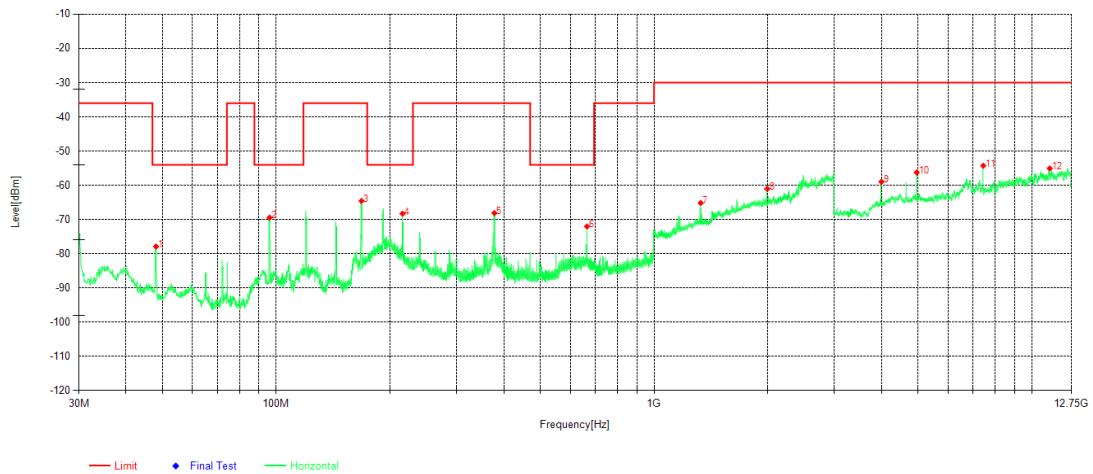
Project No	E20241111636501	EUT:	Climate Sensor W100
Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	TX BLE 2M_2402MHz	Voltage:	DC 3V
Environment:	24.3 °C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/



#### Suspected Data List

NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	65.017	-60.91	-76.15	-54.00	22.15	-15.24	RMS	Vertical
2	96.348	-50.43	-69.73	-54.00	15.73	-19.30	RMS	Vertical
3	120.016	-46.58	-66.60	-36.00	30.60	-20.02	RMS	Vertical
4	192.087	-57.02	-74.49	-54.00	20.49	-17.47	RMS	Vertical
5	332.64	-61.92	-75.73	-36.00	39.73	-13.81	RMS	Vertical
6	664.574	-61.31	-68.64	-54.00	14.64	-7.33	RMS	Vertical
7	1328	-62.50	-61.15	-30.00	31.15	1.35	RMS	Vertical
8	1660.4	-63.87	-59.25	-30.00	29.25	4.62	RMS	Vertical
9	3988.65	-55.84	-59.38	-30.00	29.38	-3.54	RMS	Vertical
10	4803.75	-42.90	-44.68	-30.00	14.68	-1.78	RMS	Vertical
11	6749.85	-63.70	-57.43	-30.00	27.43	6.27	RMS	Vertical
12	12079.2	-68.71	-55.33	-30.00	25.33	13.38	RMS	Vertical

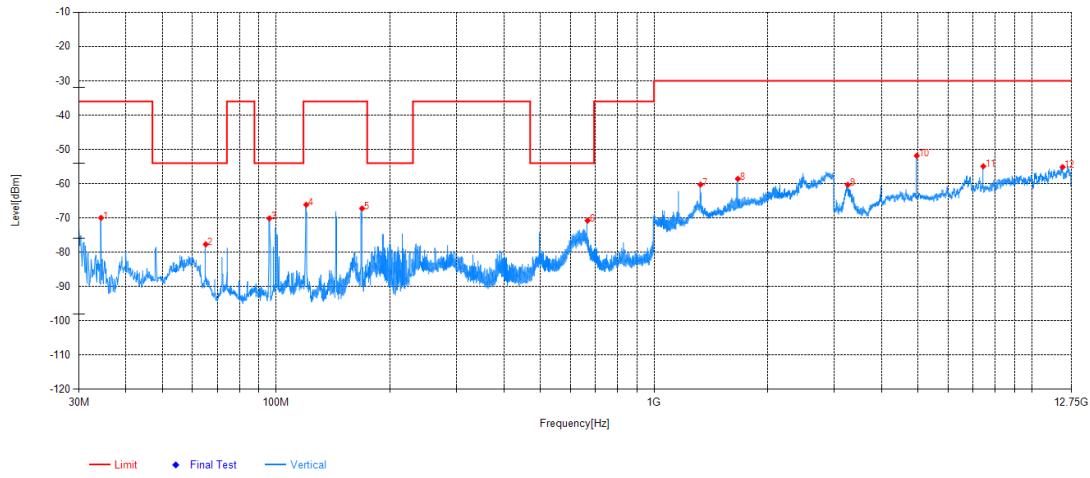
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Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	TX BLE 2M_2480MHz	Voltage:	DC 3V
Environment:	24.3 °C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/



#### Suspected Data List

NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	48.042	-61.59	-77.89	-54.00	23.89	-16.30	RMS	Horizontal
2	95.96	-52.57	-69.46	-54.00	15.46	-16.89	RMS	Horizontal
3	168.031	-45.07	-64.58	-36.00	28.58	-19.51	RMS	Horizontal
4	215.852	-50.98	-68.31	-54.00	14.31	-17.33	RMS	Horizontal
5	377.842	-55.76	-68.12	-36.00	32.12	-12.36	RMS	Horizontal
6	664.477	-64.62	-72.04	-54.00	18.04	-7.42	RMS	Horizontal
7	1328.8	-65.91	-65.16	-30.00	35.16	0.75	RMS	Horizontal
8	1994.2	-67.36	-61.01	-30.00	31.01	6.35	RMS	Horizontal
9	3999.375	-55.18	-58.96	-30.00	28.96	-3.78	RMS	Horizontal
10	4958.775	-55.23	-56.25	-30.00	26.25	-1.02	RMS	Horizontal
11	7441.125	-59.13	-54.29	-30.00	24.29	4.84	RMS	Horizontal
12	11152.95	-67.92	-55.08	-30.00	25.08	12.84	RMS	Horizontal

Project No	E20241111636501	EUT:	Climate Sensor W100
Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	TX BLE 2M_2480MHz	Voltage:	DC 3V
Environment:	24.3 °C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/



#### Suspected Data List

NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	34.365	-53.88	-69.96	-36.00	33.96	-16.08	RMS	Vertical
2	65.017	-62.44	-77.68	-54.00	23.68	-15.24	RMS	Vertical
3	95.863	-50.81	-70.13	-54.00	16.13	-19.32	RMS	Vertical
4	120.016	-46.12	-66.14	-36.00	30.14	-20.02	RMS	Vertical
5	168.613	-49.32	-67.22	-36.00	31.22	-17.90	RMS	Vertical
6	666.708	-63.26	-70.76	-54.00	16.76	-7.50	RMS	Vertical
7	1328	-61.62	-60.27	-30.00	30.27	1.35	RMS	Vertical
8	1666.2	-63.36	-58.59	-30.00	28.59	4.77	RMS	Vertical
9	3258.375	-53.70	-60.33	-30.00	30.33	-6.63	RMS	Vertical
10	4960.725	-50.94	-51.85	-30.00	21.85	-0.91	RMS	Vertical
11	7441.125	-59.86	-54.94	-30.00	24.94	4.92	RMS	Vertical
12	12071.4	-68.55	-55.15	-30.00	25.15	13.40	RMS	Vertical

## 6.5 RECEIVER SPURIOUS EMISSIONS

Test Requirement: AS/NZS 4268:2017 Clause 7.2

Test Method: ETSI EN 300 328 V2.2.2/5.4.10.2.2

### 6.5.1 LIMIT

The spurious emissions of the receiver shall not exceed the values given in table 3.

In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or for emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p for emissions up to 1 GHz and e.i.r.p for emissions above 1 GHz.

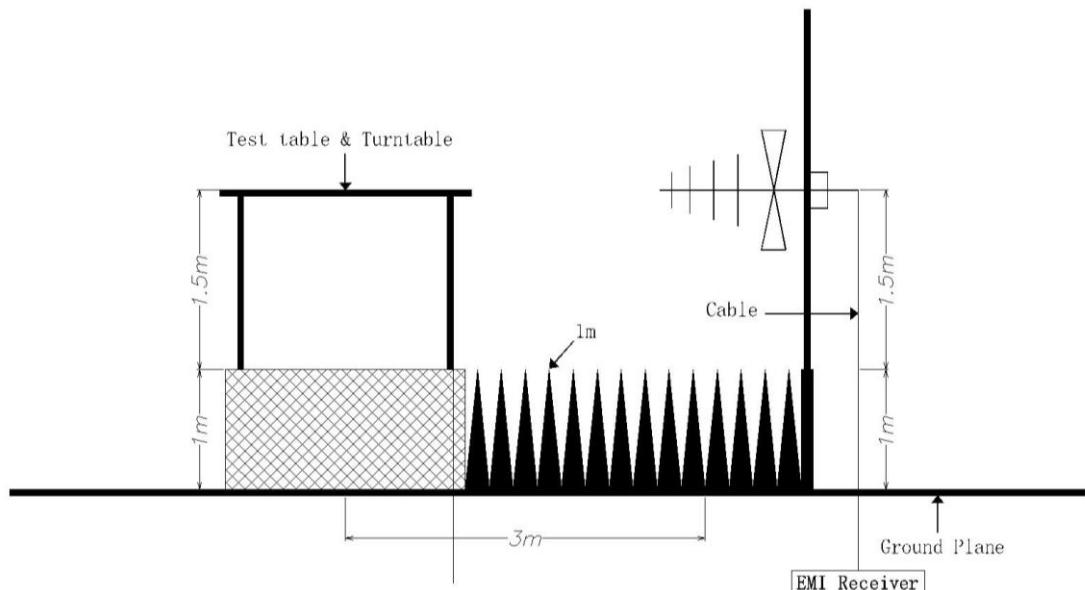
This device uses Radiated measurement.

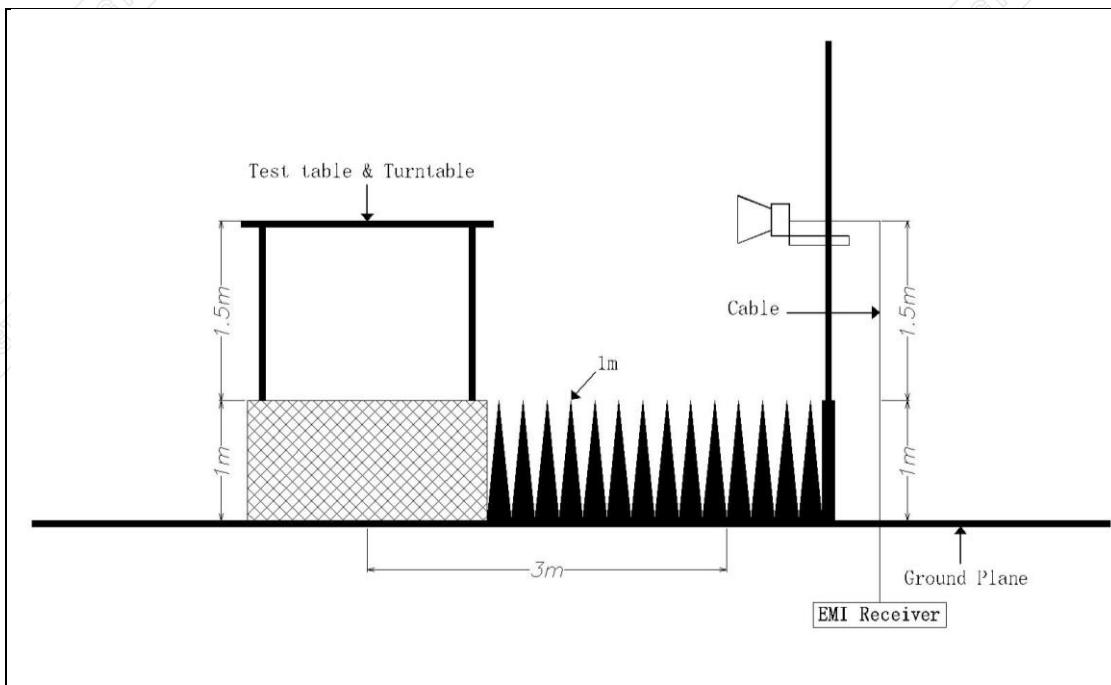
Table 3: Spurious emission limits for receivers

Frequency range	Maximum power	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12,75 GHz	-47 dBm	1 MHz

### 6.5.2 TEST CONFIGURATION

30MHz-1000MHz



**1000MHz-12750MHz****6.5.3 TEST PROCEDURES**

Test channel: Lowest channel: (2402MHz), Highest channel: (2480MHz)

Test condition: Mode 2

Test procedure: Test procedure is according to Clause 5.4.10.2.2 of ETSI EN 300 328 V2.2.2

Remark: /

**6.5.4 DATA SAMPLE**

Frequency [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
XXX	-58.02	-73.33	-57.00	16.33	-15.31	RMS	Horizontal

Frequency (MHz) = Emission frequency in MHz

Reading (dBm) = Uncorrected Analyzer / Receiver reading

Level (dBm) = Reading (dBm) + Factor (dB)

Limit (dBm) = Limit stated in standard

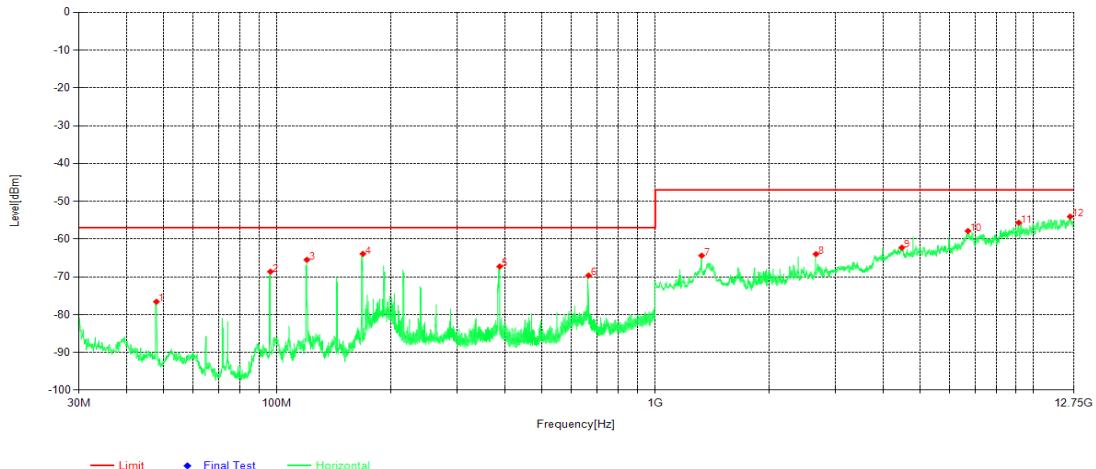
Margin (dB) = Limit (dBm) – Level (dBm)

RMS = Root Mean Square

## 6.5.5 TEST RESULTS

Pre-scan all modes and recorded the worst case results in this report (BLE 1M).

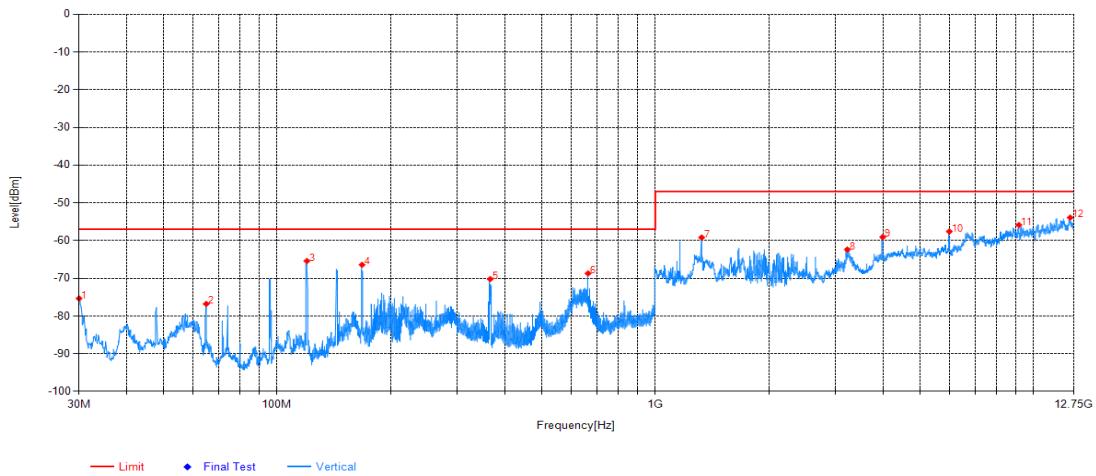
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Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	RX BLE 1M_2402MHz	Voltage:	DC 3V
Environment:	24.3°C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/



Suspected Data List

NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	48.042	-60.30	-76.60	-57.00	19.60	-16.30	RMS	Horizontal
2	96.154	-51.75	-68.64	-57.00	11.64	-16.89	RMS	Horizontal
3	120.016	-46.96	-65.49	-57.00	8.49	-18.53	RMS	Horizontal
4	168.71	-44.42	-63.91	-57.00	6.91	-19.49	RMS	Horizontal
5	388.027	-55.72	-67.28	-57.00	10.28	-11.56	RMS	Horizontal
6	666.223	-62.14	-69.65	-57.00	12.65	-7.51	RMS	Horizontal
7	1326.65	-52.87	-64.39	-47.00	17.39	-11.52	RMS	Horizontal
8	2661.45	-53.99	-63.98	-47.00	16.98	-9.99	RMS	Horizontal
9	4486.225	-61.08	-62.27	-47.00	15.27	-1.19	RMS	Horizontal
10	6709.325	-63.25	-57.87	-47.00	10.87	5.38	RMS	Horizontal
11	9142.75	-65.42	-55.68	-47.00	8.68	9.74	RMS	Horizontal
12	12493.85	-68.70	-54.06	-47.00	7.06	14.64	RMS	Horizontal

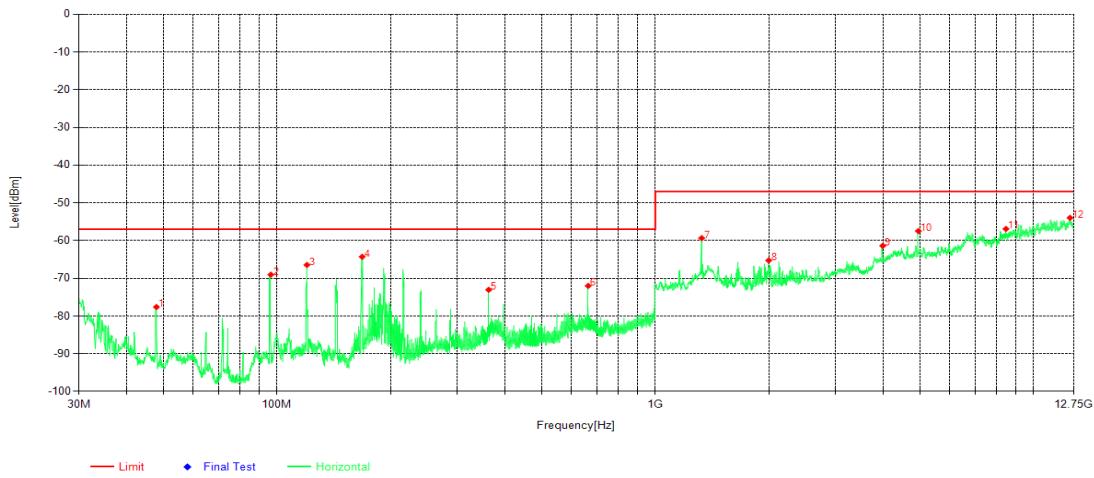
Project No	E20241111636501	EUT:	Climate Sensor W100
Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	RX BLE 1M_2402MHz	Voltage:	DC 3V
Environment:	24.3°C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/



#### Suspected Data List

NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	30	-57.68	-75.35	-57.00	18.35	-17.67	RMS	Vertical
2	65.017	-61.57	-76.81	-57.00	19.81	-15.24	RMS	Vertical
3	120.016	-45.40	-65.42	-57.00	8.42	-20.02	RMS	Vertical
4	167.934	-48.54	-66.42	-57.00	9.42	-17.88	RMS	Vertical
5	366.202	-57.09	-70.22	-57.00	13.22	-13.13	RMS	Vertical
6	664.574	-61.37	-68.70	-57.00	11.70	-7.33	RMS	Vertical
7	1326.65	-47.46	-59.20	-47.00	12.20	-11.74	RMS	Vertical
8	3219.575	-55.43	-62.38	-47.00	15.38	-6.95	RMS	Vertical
9	3995.075	-55.69	-59.09	-47.00	12.09	-3.40	RMS	Vertical
10	5986.7	-59.23	-57.59	-47.00	10.59	1.64	RMS	Vertical
11	9148.625	-65.86	-55.89	-47.00	8.89	9.97	RMS	Vertical
12	12502.07	-68.89	-53.91	-47.00	6.91	14.98	RMS	Vertical

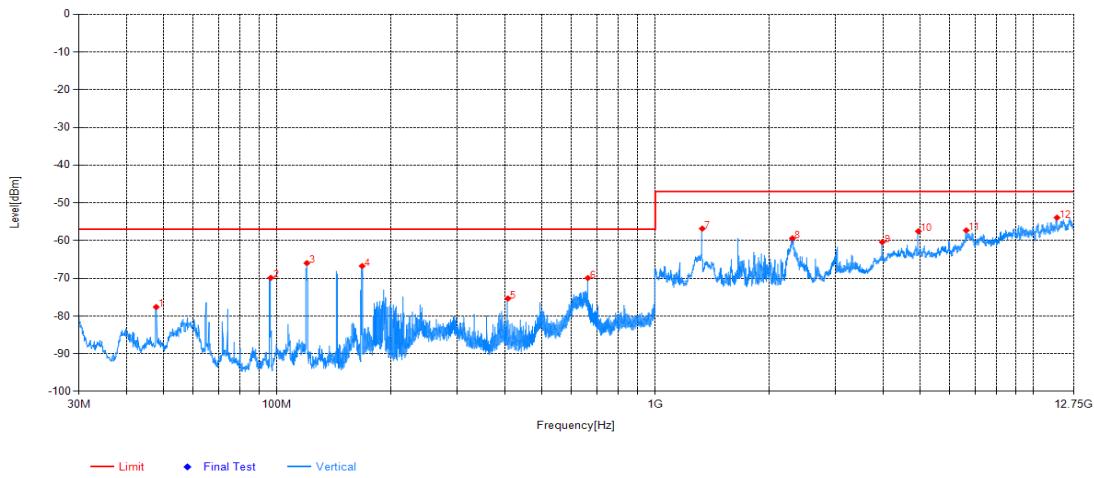
Project No	E20241111636501	EUT:	Climate Sensor W100
Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	RX BLE 1M_2480MHz	Voltage:	DC 3V
Environment:	24.3°C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/



#### Suspected Data List

NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	48.042	-61.32	-77.62	-57.00	20.62	-16.30	RMS	Horizontal
2	96.348	-52.16	-69.05	-57.00	12.05	-16.89	RMS	Horizontal
3	120.016	-47.93	-66.46	-57.00	9.46	-18.53	RMS	Horizontal
4	168.031	-44.79	-64.30	-57.00	7.30	-19.51	RMS	Horizontal
5	363.001	-59.83	-73.06	-57.00	16.06	-13.23	RMS	Horizontal
6	665.059	-64.58	-72.03	-57.00	15.03	-7.45	RMS	Horizontal
7	1326.65	-47.84	-59.36	-47.00	12.36	-11.52	RMS	Horizontal
8	1995.225	-53.95	-65.28	-47.00	18.28	-11.33	RMS	Horizontal
9	3993.9	-57.59	-61.38	-47.00	14.38	-3.79	RMS	Horizontal
10	4960.925	-56.51	-57.48	-47.00	10.48	-0.97	RMS	Horizontal
11	8456.55	-64.50	-56.93	-47.00	9.93	7.57	RMS	Horizontal
12	12489.15	-68.51	-53.98	-47.00	6.98	14.53	RMS	Horizontal

Project No	E20241111636501	EUT:	Climate Sensor W100
Model:	TH-S04E	Sample No:	E20241111636501-0001
Mode:	RX BLE 1M_2480MHz	Voltage:	DC 3V
Environment:	24.3°C/61%RH/101.0kPa	Engineer:	Zhao Yaru
Test Date:	2024-11-15	/	/



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Detector	Polarity
1	47.945	-64.09	-77.62	-57.00	20.62	-13.53	RMS	Vertical
2	96.348	-50.60	-69.90	-57.00	12.90	-19.30	RMS	Vertical
3	120.016	-45.96	-65.98	-57.00	8.98	-20.02	RMS	Vertical
4	167.934	-48.88	-66.76	-57.00	9.76	-17.88	RMS	Vertical
5	408.009	-63.38	-75.37	-57.00	18.37	-11.99	RMS	Vertical
6	663.701	-62.67	-69.94	-57.00	12.94	-7.27	RMS	Vertical
7	1331.35	-45.08	-56.83	-47.00	9.83	-11.75	RMS	Vertical
8	2305.425	-49.29	-59.41	-47.00	12.41	-10.12	RMS	Vertical
9	3982.15	-56.84	-60.41	-47.00	13.41	-3.57	RMS	Vertical
10	4960.925	-56.69	-57.53	-47.00	10.53	-0.84	RMS	Vertical
11	6638.825	-62.13	-57.31	-47.00	10.31	4.82	RMS	Vertical
12	11533.87	-67.81	-53.92	-47.00	6.92	13.89	RMS	Vertical

## **APPENDIX A. PHOTOGRAPH OF THE TEST CONNECTION DIAGRAM**

Please refer to the attached document E20241111636501-Test Photo.

## **APPENDIX B. PHOTOGRAPHS OF EUT**

Please refer to the attached document E20241111636501-EUT Photo.

----- End of Report -----